

What Is Claimed Is:

1. A disk array device, comprising:  
a disk array device enclosure;  
a plurality of disk drives stored in the disk array device enclosure;

a controller, which controls the reading and writing of data from and to the disk drives; and

a fiber channel cable connecting the disk drives and the controller,

wherein:

the disk drives include two types of disk drive, which are a fiber channel disk drive with a fiber channel interface, and a serial disk drive with a serial interface;

the serial disk drive is connected to the fiber channel cable via an interface connection device that converts the serial interface to a fiber channel interface; and

the controller discriminates the type of each of the disk drives by communicating via the fiber channel cable.

2. The disk array device according to claim 1, further comprising:

a plurality of the controller, the controllers being

mutually connected by means of the fiber channel cable and connected to each of the disk drives individually to form a plurality of fiber channel loops; and

a switch, which is interposed between each serial disk drive and the plurality of fiber channel cables and switches the connection destination of the serial disk drive between the plurality of fiber channel cables.

3. The disk array device according to claim 1, further comprising:

a plurality of disk drive enclosures that stores the plurality of disk drives for each of the disk-drive types,

wherein:

each of the disk drive enclosures for storing the serial disk drive comprises a management unit for managing the operating state of each stored disk drive; and

the controller discriminates the type by communicating with the management unit.

4. The disk array device according to claim 1, further comprising:

a plurality of disk drive enclosures, which stores the plurality of disk drives for each of the disk-drive types and allocates an address to each of the disk drives according to

a certain rule corresponding with the type,

wherein:

the controller discriminates the type on the basis of the address allocated to each of the disk drives within the disk drive enclosure.

5. The disk array device according to claim 4, wherein:

the address space allocated to the disk drive varies according to the type; and

the controller performs the discrimination on the basis of the address-space difference.

6. The disk array device according to claim 4, wherein:

the relationship between the location of the disk drive within the disk drive enclosure and the address allocated to each of the disk drives varies in accordance with the type; and

the controller performs the discrimination on the basis of this relationship.

7. The disk array device according to claim 1, further comprising:

a backboard on which a plurality of connectors for connecting the plurality of disk drives is arranged,

wherein:

the plurality of connectors is a mixture of connectors for which at least one of the position and shape differ(s) according to the type of disk drive; and

the controller discriminates the type on the basis of the connector to which the disk drive is connected.

8. The disk array device according to claim 7, wherein:

the interface connection device is connected to the connector to which the serial disk drive is to be connected on the backboard.

9. The disk array device according to claim 7, further comprising:

a plurality of disk drive enclosures for storing the plurality of disk drives via the backboard,

wherein:

the type of the stored disk drive is standardized for each of the disk drive enclosures; and

the controller performs the discrimination for each of the disk drive enclosures on the basis of the connector to which at least one disk drive is connected.

10. The disk array device according to claim 7, further

comprising:

a plurality of disk drive enclosures that store the plurality of disk drives via the backboard,

wherein:

a mixture of the disk drives of the plurality of types can be stored in the disk drive enclosure; and

the controller performs the discrimination for each of the disk drives on the basis of the connector to which the disk drive is connected.

11. The disk array device according to claim 1, further comprising:

a plurality of racks for housing each of the disk drives,

wherein:

the plurality of racks have standardized external dimensions; and

the rack for storing the serial disk drive contains the interface connection device.

12. The disk array device according to claim 11, wherein:

the disk drive comprises at least one of:  
position-regulating holes provided in uniform positions  
irrespective of the disk-drive type and

erroneous-insertion-preventing holes provided in only one of the fiber channel disk drive and serial disk drive; and

the rack contains at least one of: tapered position-regulating pins provided in correspondence with the position-regulating holes and pins provided in correspondence with the erroneous-insertion-preventing holes.

13. A management method according to which, in a disk array device in which a plurality of disk drives and a controller for controlling the reading and writing of data from and to the disk drives are stored in a disk array device enclosure so as to be connected via a fiber channel cable, the controller manages the disk drives, which include two types of disk drive which are a fiber channel disk drive with a fiber channel interface and a serial disk drive with a serial interface, and the serial disk drive is connected to the fiber channel cable via an interface connection device that converts the serial interface to a fiber channel interface,

the management method comprising:

a step in which the controller communicates directly or indirectly with at least some of the disk drives via the fiber channel cable; and

a step of discriminating the type of each of the disk drives on the basis of this communication.

14. The management method according to claim 13, wherein the disk array device comprises:

a plurality of the controller, the controllers being mutually connected by means of the fiber channel cable and connected to each of the disk drives individually to form a plurality of fiber channel loops; and

a switch, which is interposed between each serial disk drive and the plurality of fiber channel cables and switches the connection destination of the serial disk drive between the plurality of fiber channel cables; and

the controllers perform the discrimination individually.

15. The management method according to claim 13, further comprising:

a plurality of disk drive enclosures that stores the plurality of disk drives for each of the disk-drive types,

wherein:

each of the disk drive enclosures for storing the serial disk drive comprises a management unit for managing the operating state of each stored disk drive; and

the controller discriminates the type by communicating with the management unit.

16. The management method according to claim 13, further comprising:

a plurality of disk drive enclosures, which stores the plurality of disk drives for each of the disk-drive types and allocates an address to each of the disk drives according to a certain rule corresponding with the type,

wherein:

the controller discriminates the type on the basis of the address allocated to each of the disk drives within the disk drive enclosure.

17. The management method according to claim 16, wherein:

the address space allocated to the disk drive varies according to the type; and

the controller performs the discrimination on the basis of the address-space difference.

18. The management method according to claim 16, wherein:

the relationship between the location of the disk drive within the disk drive enclosure and the address allocated to each of the disk drives varies in accordance with the type; and



the controller performs the discrimination on the basis of this relationship.

19. The management method according to claim 13, further comprising:

a backboard on which a plurality of connectors for connecting the plurality of disk drives is arranged,

wherein:

the plurality of connectors is a mixture of connectors for which at least one of the position and shape differ(s) according to the type of disk drive; and

the controller discriminates the type on the basis of the connector to which the disk drive is connected.

20. The management method according to claim 19, further comprising:

a plurality of disk drive enclosures for storing the plurality of disk drives via the backboard,

wherein:

the type of the stored disk drive is standardized for each of the disk drive enclosures; and

the controller performs the discrimination for each of the disk drive enclosures on the basis of the connector to which at least one disk drive is connected.

21. The management method according to claim 19, further comprising:

a plurality of disk drive enclosures that store the plurality of disk drives via the backboard,

wherein:

a mixture of the disk drives of the plurality of types can be stored in the disk drive enclosure; and

the controller performs the discrimination for each of the disk drives on the basis of the connector to which the disk drive is connected.

22. A disk array device, comprising:

a controller enclosure that comprises: a communication control unit that is connected to a host device and receives data from the host device; cache memory that is connected to the communication control unit and stores data exchanged between the communication control unit and the host device; a plurality of controllers that is connected to the host device and the cache memory and performs control so that data exchanged between the host device and the cache memory is transferred to the communication control unit or received from the communication control unit; information storage memory that saves information managed by the plurality of controllers;

and a plurality of drive interfaces that transfers data, which is received by the host device, under the control of the plurality of controllers; and

a serial disk drive enclosure that comprises: a plurality of fiber channel loops connected to the plurality of drive interfaces in the controller enclosure; a plurality of switching circuits that is connected to the plurality of fiber channel loops and that is used to switch the connection between the controller enclosure and the serial disk drive enclosure; a plurality of interface connection devices that is connected to the plurality of controllers by means of the plurality of fiber channel loops and that is connected to a fiber channel interface used by the plurality of fiber channel loops and to a serial disk drive interface; a plurality of dual-port switching devices that is connected to the plurality of interface connection devices and that controls switching to receive data from the plurality of interface connection devices; a plurality of serial disk drives that is connected to the plurality of dual-port switching devices and that stores data transferred by means of the drive interface by receiving this data via the fiber channel loops, the switching circuits, the interface connection devices and the dual-port switching devices; and an enclosure management processor that monitors the operation of the interface connection devices,

wherein:

the plurality of interface connection devices collects information on the disk drive connected to the serial disk drive enclosure; judges whether the disk drive connected to the serial disk drive enclosure is a serial disk drive; and, when the disk drive connected to the serial disk drive enclosure is a serial disk drive, reports the fact that the disk drive connected to the serial disk drive enclosure is a serial disk drive to the controller by using the fiber channel loops; and

the controller registers the fact that the disk drive connected to the serial disk drive enclosure is a serial disk drive in the memory and manages the disk drive connected to the serial disk drive enclosure as a serial disk drive.